

**ABSTRACT**

An optical AND logic gate includes a summing gate having first and second inputs for receiving first and second optical signals, and a threshold device. The gate produces an output corresponding to the AND product of the first and second optical signals. In another version the AND gate includes first and second inputs for receiving first and second optical signals, and an optical loop for producing an output corresponding to the AND product of the first and second optical signals. In an alternative versions a NAND gate is provided by applying an optical logic NOT on an AND gate.